On the relationship between economic freedom and economic growth

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Abstract

Often it is maintained that economic freedom may further high levels of economic growth. This paper compares various indicators for economic freedom. It is concluded that although these measures differ somewhat in their coverage, they show similar rankings for the countries covered. Some elements in these measures are, however, questionable. The robustness of the relationship between freedom and growth is also examined. Our main conclusion is that more economic freedom fosters economic growth.

Keywords: economic freedom, economic growth, sensitivity analysis

JEL-code: O11, O47, P51

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> "I believe that free societies have arisen and persisted only because economic freedom is so much more productive economically than other methods of controlling economic activity." (Milton Friedman, Foreword in Gwartney et al., 1996).

1. Introduction

Cultural norms and institutions are often believed to explain why certain countries grow rich and others remain poor (Landes, 1998). One important question in this regard is the role of economic freedom. What connection, if any, is there between economic development and economic liberties? Liberals think that the demise of socialism and of old, state-led, import-substitution models of development will bring faster, more sustained growth to countries that keep (or make) their economies free. Others argue that state control, if intelligently applied, can boost growth. This debate has been bedeviled by two things. First, a lack of any clear definition of what is meant by economic freedom, and of how to measure it. Second, a lack of data that applies this definition across a wide enough range of countries and over a long enough stretch of time to test credibly whether there is a correlation between freedom and prosperity.

Over the last decade or so, this situation has gradually changed. A number of indicators for economic freedom have become available and they have subsequently been applied in empirical growth models. What is missing, so far, is a thorough comparison and evaluation of these indicators. That is the first aim of the present paper. We focus on two indicators that have attracted considerable attention recently, i.e. the indicator of the Fraser Institute and that of the Heritage Foundation/Wall Street Journal. The reason for choosing these indicators is that they are available for a wide range of countries for a large number of years and that they are comparable. Although we focus on these indicators, in reviewing the literature we will also mention other attempts.

The second aim is to review and extend the empirical evidence on the relationship between economic freedom and economic development. A serious problem here is that economic theory does not provide enough guidance with respect to the proper specification of the empirical model. The so-called extreme bound analysis of Leamer (1983) and Levine and Renelt (1992) is therefore often used to examine how robust the variable of interest - in our case a measure of economic freedom - is related to economic growth. Sali-i-Martin (1997) recently argued that the test applied in the extreme bound analysis is too strong for any variable to really pass it. Instead of analyzing the extreme bounds of the estimates of the coefficient of a particular variable, Sali-i-Martin suggests to analyze the entire distribution. He concludes that the picture emerging from the empirical growth literature is not the pessimistic "Nothing is Robust" that we get with the extreme bound analysis. Instead, he finds that a substantial number of variables can be found to be strongly related to growth. The present paper applies both approaches to the relationship between economic freedom and economic growth.

The remainder of the paper is structured as follows. Section 2 discusses the contents of the indicators that we focus on, while section 3 shows their correlation. Section 4 reviews previous studies on the relationship between economic freedom and economic growth, while section 5 presents our estimation results. The final

section offers some concluding comments.

2. Review of indicators

Economic theory indicates that economic freedom affects incentives, productive effort, and the effectiveness of resource use. Indeed, since the time of Adam Smith, if not before, economists and economic historians have argued that the freedom to choose and supply resources, competition in business, trade with others and secure property rights are central ingredients for economic progress (see e.g. North and Thomas, 1973). The new growth theory boosted interest in this issue. A number of recent empirical studies suggest that economic freedom may be important in explaining cross-country differences in economic performance (De Vanssay and Spindler, 1994; Alesina, 1998; De Haan and Siermann, 1998; Nelson and Singh, 1998).

Still, it is not always clear what authors mean if they write about economic freedom. We start with the definition as provided by Gwartney et al. (1996): Individuals have economic freedom when (a) property they acquire without the use of force, fraud, or theft is protected from physical invasions by others, and (b) they are free to use, exchange, or give their property to another as long as their actions do not violate the identical rights of others.[1] On the basis of this definition, an index of economic freedom should measure the extent to which rightly acquired property is protected and individuals are free to engage in voluntary transactions. In an economically free society, the fundamental function of government is the protection of private property and the enforcement of contracts. When a government fails to protect private property, takes property itself without full compensation or establishes restrictions that limit voluntary exchange, it violates the economic freedom of its citizens. Institutional arrangements that restrain trade, increase transaction costs, weaken property rights, and create uncertainty will reduce the realization of gains from trade and also the incentive of individuals to engage in productive activities.

Gwartney et al. (1996) argue that it is important to distinguish economic freedom from political and civil liberties. Political liberty is present when citizens are free to participate in the political process (vote, lobby, and choose among candidates), elections are fair and competitive, and alternative parties are allowed to participate freely. Civil liberty encompasses the freedom of the press and the rights of individuals to assemble, hold alternative religious views, receive a fair trial and express their views without fear of physical retaliation. Gwartney et al. (1996) argue that a country may be liberal in a political sense - that is, be highly democratic while the major civil liberties are protected - and still adopt policies that conflict with economic freedom.

A different view has been put forward by Freedom House. Wright (1982, pp. 51-52), for instance, argues: "To examine economic freedom is to assess the degree to which persons are free individually and collectively to undertake economic activities of their choice, regardless of political structure. Collectively, a fundamental aspect of this freedom is the extent to which the economic system that controls choice reflects the expressed preferences of the majority of the citizenry rather than those of a ruling few....In those societies that guarantee effective participation by the citizenry in the political decision-making process, the nature of the economic system is most likely to reflect the preferences of a majority of the groups in society for certain economic arrangements and relationships....Economic freedoms existing within a democratic political framework may be called legitimated or voter-approved economic freedoms, reflecting the participatory and

legitimating process by which the range and limits of economic activities are established." In the reasoning of Freedom House there is thus a substantial difference between the degree to which people are free individually and collectively to undertake economic activities. Individual freedom means the right to pursue economic activities free from arbitrary control and interference by the state and other individuals. Collective freedom refers to the extent to which the economic system that controls choice reflects the expressed preferences of the majority of the citizenry rather than those of a ruling few. Rabushka (1991c, p. 61) rejects this line of reasoning: "Wright's definition of collective economic freedom ... is not a statement about some collective economic right that exists apart from the sum of the rights enjoyed by all the individuals in any society. This concept of collective economic freedom has no foundation in the classical liberal tradition of John Locke and Adam Smith. It represents a complete departure from the premise of methodological individualism in favour of group action." As we will show below, this issue is of crucial importance with respect to certain elements to be taken into account in the construction of an indicator of economic freedom.[2]

Given a general definition the next step is to decide on the elements that should be included in constructing a proper indicator. Table 1 compares two well known recent indicators in this respect.[3] A detailed examination may be useful, as it is a way of gaining a more sophisticated understanding of what is meant by economic freedom.

Table 1 A comparison of two indicators of economic freedom

Aspect:	Fraser Institute (Gwartney et al., 1996)	Heritage Foundation/Wall Street Journal (Holmes et al., 1998)
International trade	1. Taxes on international trade; 2. Size of a country's trade relative to potential	1. Level of tariff and ntb's and corruption in the customs service
International capital flows	3. Restrictions on capital flows	2. Restrictions on Capital flows and Foreign Investment
Black market	4. Differences between an official exchange rate and black-market rate	3. Presence of black market in general
Taxes	5. Top marginal tax rates (and income threshold at which it applies); 6. Is there conscription?	4. Taxation: Rates of Income Tax (top rate and rate that applies to average income) and Profit Taxes
Government intervention	7. Public consumption spending as a share of GDP; 8. Subsidies and transfer payments as a share of GDP; 9. The role and presence of state-operated enterprises	5. Government intervention in the economy measured by government consumption share, government ownership of business and output produced by government
Monetary policy and inflation	10. Volatility of inflation; 11. Monetary growth rate	6. Average Inflation
Banking	12. Citizens' rights to hold foreign-currency accounts domestically; 13. Citizens' rights to hold bank account abroad	7. Freedom in banking, including restrictions on foreign banks and government regulation and ownership
Price controls and regulation and Market entry	14. Price controls; 15. Controls on borrowing and lending rates; 16. Freedom to compete in markets (only in latest versions)	8. Wage and price controls (including minimum wage laws, price controls, government subsidies); 9. Government regulation concerning undertaking of certain activities (licensing requirements, corruption in the bureaucracy, labour regulations, environmental and safety regulations)
Property rights	17. Equality of citizens under law and access to judiciary (only in latest versions)	10. Property rights: including freedom from government influence over judicial system, expropriation, corruption within judiciary

The indicator of the Heritage Foundation/Wall Street Journal (Holmes et al., 1998) takes 10 elements into account: trade policy, taxation, government intervention in the economy, monetary policy, foreign investment, banking, wage and price controls, property rights and black market activity. Under every heading a number of questions (a total of 50) is asked on the basis of which the score - running from 1 (most free) to 5 (least free) - for the aspect concerned is given. The unweighted average of all 10 elements constitutes the economic freedom rating of that country.

Gwartney et al. (1996) choose 17 measures and rate a high number of countries on each of these measures on a scale of 0-10, in which zero means that a country is completely unfree and ten means it is completely free. The measures are in four broad areas: Money and inflation; Government operations and regulations; "Takings" and discriminatory taxation; and International exchange. These 17 measures are combined in three ways in aggregated rankings. In the first Index (**Ie**) each component is assigned a weight equal to the inverse of its standard deviation, while in the Index **Is1** the importance of the components is based on a survey under experts in the field of economic freedom. Finally, in the Index **Is2** the weighing is also based on a survey, but this time the survey was held under a number of country experts. These indicators are available for 1975, 1980, 1985, 1990, and 1995 and for more recent years (see Gwartney et al., 1996). As they are available for a large number of countries for quite a long period, we have used these indicators in our empirical work. In the remainder of this section we therefore focus our discussion on the Fraser Institute indicator. As follows from Table 1, both the Fraser Institute and Heritage Foundation/Wall Street Journal indicators are, however, very similar. So much of the conceptual discussion also applies to the indicator of the Heritage Foundation/Wall Street Journal.

Gwartney et al. argue that *taxes on international trade* limit the freedom of domestic residents to trade with foreigners. Many nations restrain trade through the use of quotas, monopoly grants, and various other types of discriminatory regulations. These measures are every bit as much a violation of economic freedom as tariffs, export duties, and exchange rate controls. Gwartney et al. devised an indirect method designed to approximate their severity, using regression analysis to estimate the *expected size of the trade sector* for each country, given its geographic size, population, and location relative to potential trading partners. If the actual size of a country's trade sector as a share of GDP was significantly smaller than expected, this is consistent with the view that its trade sector was reduced as the result of quotas and other regulatory restraints. Exchange rate controls often make it difficult for people to trade with outsiders. The *black market premium* indicates how severe these restrictions may be.

As follows from table 1, Gwartney et al. also take *government taxes and spending* into account in their economic freedom measure. They argue (pp. 29-30): "When a government plays favourites - when it takes from one group in order to make transfers to others or when it imposes the costs of public services disproportionately on various groups - the government becomes an agent of plunder. Such actions conflict with economic freedom. This is equally true whether the policies are undertaken by a dictatorial political leader or a legislative majority..... When governments tax income from one person in order to transfer it to another, they are denying individuals the fruits of their labours.... High marginal tax rates discriminate against productive citizens and deny them the fruits of their labour. In essence, such rates seize wealth from taxpayers without providing them an

equivalent increase in service." Similarly, Gwartney et al. argue that, in essence, *military conscription* denies draftees the property right to their labour services. While national defense is an acceptable activity for a "protective and productive" state, the cost of that protection should be imposed on all citizens. Singling out a specific group to pay for something that benefits all is a clear "taking" and a discriminatory form of taxation. As Milton Friedman (1962, p. 36) puts it: "There is no justification for not paying whatever is necessary to attract the requested number of men."

Economic freedom is also said to be reduced due to *state enterprises*: "Government-operated enterprises ... involve the substitution of political coercion for market decision-making." (Gwartney et al., 1996, p. 23).

Monetary disturbances and unexpected inflation changes the value of money and thereby threaten economic freedom. Therefore, Gwartney et al. include the *money supply* (in excess of the growth rate of potential GDP) and the *standard deviation of annual inflation* during the last five years as part of their empirical measure of economic freedom. When citizens have the *freedom to maintain bank accounts* in foreign currencies or abroad, it is easier for them to avoid the uncertainties accompanying an unstable domestic monetary regime.

Price controls interfere with the freedom of buyers and sellers to undertake exchanges even though the terms of trade are mutually agreeable. Price controls also, in effect, take property from a private owner. The impact of *credit market regulations*, interest rate controls, and government operation of the banking system on the freedom of citizens to borrow and lend.

Governments often require licenses and/or impose other restraints that *limit the entry* of firms into various business activities and of individuals into various occupations.

A legal structure that clearly defines *property rights*, enforces contracts, and provides a mutually agreeable mechanism for the settlement of contractual and property right disputes provides the foundation for a free economy.

A number of critical remarks are in order here. First, should the level of taxes be included? Of course, taxes always distort prices, but that in itself does not make it necessary to include the level of taxation in an index of economic freedom. So the argumentation of the Heritage Foundation/Wall Street Journal is ill-founded, where it is simply stated that all taxes are harmful to economic activity because a tax essentially is a government-imposed disincentive to perform the activity being taxed. In line with the definition of Gwartney et al. (1996) one line of argument would be that if the tax system was agreed upon voluntarily, the level of taxes does not restrict freedom. In real life, of course, decisions as such are not based on unanimity. This brings us back to the approach of Wright, who stresses majority voting as the crucial issue. However, Gwartney et al. (1996) are heading in another direction, which seems more in line with the view put forward by Rothbard in which the key feature that distinguishes the state from private persons and groups is that the former obtains its revenue by coercion, known as taxation, whereas the latter obtain their income voluntarily by selling goods and services to others or by voluntary gift. To Rothbard, taxation is theft, pure and simple. As Rabushka (1991b) puts it: "A Rothbardian rating of economic freedom would be the simplest measure to construct: it would rest solely on the extent to which all resources in any economy are held in the form of valid property titles and are subject to voluntary exchange with no interference by the state. Since every country in the world has some state interference in the economy, a rating scheme based on Rothbard's libertarian vision is more Utopian than practical. Every other

philosopher of economic freedom, from John Locke to Adam Smith to Milton Friedman to Robert Nozick, grants specific, if limited, powers to government or the state, including the power to tax, enforce laws, maintain order, and defend the nation. Rating schemes based on these alternative conceptions of economic freedom would permit larger measures of government activity. They would also take into account the real world activities of governments." This, of course, implies that these necessary government functions have to be financed. The question then becomes what level of taxes (spending) is acceptable (i.e. does not reduce freedom)? Surprisingly enough, Gwartney et al. themselves also seem to defend this line of argument, as they state (p. 22): "There are two broad functions of government that are consistent with economic freedom: (1) protection of individuals and their property against invasions by intruders, both domestic and foreign and (2) provision of a few select goods - what economists call public goods - which have characteristics that make them difficult for private business firms to produce and market.... When governments move beyond these protective and productive functions into the provision of private goods, they restrict consumer choice and economic freedom." In constructing their economic freedom indicator, they simply forget these nuances and just focus on levels of taxes and spending. Of course this is not to argue that taxes are not important and that a high level of taxation is irrelevant for economic growth, but we doubt whether it should be included in this way in an empirical measure of economic freedom. In a more practical vein, we also consider it improper to simply take tax rates into account as e.g. Holmes et al. (1998) do, since the actual tax burden also depends on other features of the tax system, like tax allowances and other factors determining tax payments (like deductions).

A similar argument can be raised against inclusion of government consumption in an index of economic freedom. Although there is some evidence suggesting that a high level of government consumption may hamper economic growth (see e.g. Barro, 1991; Alesina, 1998) it is doubtful whether the level of government consumption spending should be part of the concept of economic freedom.[4]

Second, the way monetary policy is taken up in some of these indicators also raises some questions. For one thing, many authors have argued that inflation is a tax and should be treated as such. Like every other tax it has distortive effects and optimal policy would be to choose such a tax mix that its distortive effects are minimal (Mankiw, 1987). So the same argument made with respect to other forms of taxation apply here as well. Again, this is not to argue that inflation as such may not be detrimental. Indeed, there are various studies suggesting that it is (Fischer, 1993; Barro 1995). However, if decisions have been taken in such a way that the preferences of the majority of the citizenry are expressed, it becomes questionable whether an inflation rate of 8% say is different from an inflation rate of 5% as is the case in the Heritage Foundation/Wall Street Journal index.

Another objection to the inclusion of both inflation (or money growth) and the standard deviation of inflation is that inflation variability is positively correlated with the level of inflation (Chowdhury, 1991).

3. An empirical analysis of various indicators

In this section we compare the different measures of economic freedom and their underlying indexes. As we do not know the probability distribution function from which these indexes are drawn, we use two concepts of nonparametric or rank correlation to compare the different measures of economic freedom. i.e. the Spearman rank-order correlation coefficient (r_s), and Kendall's correlation coefficient (r_k).[5]

We will first compare the economic freedom indicators of the Fraser Institute and the Heritage Foundation/Wall Street Journal. In order to be able to compare them, we take 1995 as our benchmark. For this year both institutes have published their rankings for comparable groups of countries. As the Fraser Institute presents three different indicators all based on the same underlying measures, we are in fact comparing four indicators. The differences between the three indicators of the Fraser institute stem from different weighing schemes used to aggregate the underlying components into one measure. For instance, to calculate Fraser's Equal Impact Index (**Ie**) each of the 17 components discussed in the previous section is assigned a weight equal to the inverse of its standard deviation. The two Survey Indexes of the Fraser Institute (**Is1** and **Is2)** are based on weights given by some experts in the field (see section 2 for further details). Table 2 reports the outcomes of the Spearman and Kendall rank-order correlation test.[6] The upper-right part of the table displays the Spearman correlation coefficients, the lower-left part reveals the ones from Kendall. As expected, the correlations between the different Fraser indexes are quite high. However, their correlations with the Heritage index are rather low; in absolute value they never exceed 0.8. Still, all correlations are significantly different from zero at a 1 percent level.

Table 2 Nonparametric correlations between two indicators of economic freedom, 1995

	Kendall \ Spearman	1	2	3	4
1	Fraser's Equal Impact Index	1	0.97	0.98	-0.74
2	Fraser's Survey Index 1	0.89	1	0.92	-0.68
3	Fraser's Survey Index 2	0.91	0.78	1	-0.77
4	Heritage's Score	-0.59	-0.52	-0.61	1

Let us now take a somewhat more closer look at the underlying components of the Fraser indexes. Table 3 compares the four broad categories which Gwartney et al. (1996) define and the three resulting summary indicators. The structure of the table is as before. Bold figures indicate that the correlation is *not* significantly different from zero at at least a 1 percent level. The category 'Takings and Discriminatory Taxation' catches the eye: neither with any other category nor with the resulting indicators is there a significant correlation.

Table 3 Nonparametric correlations between the economic freedom indicators and their underlying broad categories of the Fraser Institute (Gwartney et al.), 1995 (102 observations)

	Kendall \ Spearman	1	2	3	4	5	6	7
1	Money and Inflation	1	0.60	**-0.13**	0.71	0.84	0.75	0.88
2	Government Operations	0.43	1	**0.04**	0.61	0.86	0.84	0.81
3	Takings	**-0.10**	**0.02**	1	**-0.18**	**0.03**	**0.21**	**-0.04**
4	International Sector	0.53	0.45	**-0.14**	1	0.82	0.76	0.85
5	Equal Impact Index	0.67	0.69	**0.03**	0.65	1	0.97	0.98
6	Survey Index 1	0.57	0.68	**0.15**	0.57	0.89	1	0.92
7	Survey Index 2	0.71	0.64	**-0.03**	0.68	0.91	0.78	1

Bold: not significant at at least a 1 percent level.

In Table 4 we check the correlations between all components and the three indicators of the Fraser Institute. To save space we only report the Spearman rank-order correlation coefficients. First looking at the category 'Takings' reveals that - except for just one case - there is no significant positive relationship between its components and the economic freedom indicators. Furthermore, government consumption and the size of the trade sector seem to be unrelated to economic freedom.

Table 4 Nonparametric correlations between the economic freedom indicators and their underlying components of the Fraser Institute (Gwartney et al.), 1995 (102 observations)

Spearman	Ie	Is1	Is2	No. of Obs.
Money and Inflation				
Money Expansion (11)	0.43	0.33	0.45	102
Inflation Variability (10)	0.59	0.52	0.59	102
Foreign Currency Accounts (12)	0.63	0.59	0.68	102
Deposits Abroad (13)	0.72	0.69	0.76	102
Government Operations				
Government Consumption (7)	**0.01**	**0.14**	**-0.11**	101
Government Enterprises (9)	0.58	0.62	0.53	102
Price Controls (14)	0.70	0.62	0.71	88
Entry into Business (16)	0.75	0.72	0.76	102
Equality Under the Law (17)	0.60	0.49	0.65	102
Credit Market (15)	0.67	0.58	0.64	84
Takings				
Transfers & Subsidies (8)	**-0.24**	**0.01**	-0.38	75
Marginal Tax Rates (5)	**0.13**	0.35	**0.05**	82
Conscription (6)	**0.04**	**0.10**	**0.03**	102
International Sector				
Trade Taxes (1)	0.57	0.44	0.63	66
Exchange Rate Controls (4)	0.69	0.62	0.72	102
Exp. Size of Trade Sector (2)	**0.17**	**0.13**	**0.17**	100
Capital Restraints (3)	0.82	0.77	0.85	102

Bold: not significant at at least a 1 percent level. Numbers in parentheses refer to the numbering in table 1.

Finally, we take a look at the economic freedom indicator of the Heritage Foundation. Table 5 displays the correlations between all ten components and the resulting indicator. As we only have detailed information for 1997, the data refer to this year. Again the issue of taxation shows the lowest correlation with the other components of economic freedom.

On the basis of the foregoing analysis we have constructed our own preferred indicators of economic freedom by not including the following aspects: money expansion, government consumption, transfers and subsidies, marginal tax rates and conscription. The correlation coefficients between our new indicators and the original ones are: 0.80 for Is1, 0.91 for Ie, and 0.97 for Is2. In the remainder of the paper we will focus on the original indicators, but all estimates have also been redone using our preferred indicators. The basic conclusions are not dependent on the choice of the economic freedom indicator.

Table 5 Nonparametric correlations between the economic freedom indicator and its underlying components of the Heritage Foundation, 1997 (149 observations)

	Kendall \ Spearman	1	2	3	4	5	6	7	8	9	10	11
1	Trade (1)	1	**0.08**	0.31	**0.14**	0.49	0.51	0.46	0.59	0.54	0.53	0.68
2	Taxation (4)	**0.07**	1	0.25	**-0.04**	**0.15**	**0.20**	**0.16**	**0.11**	**0.13**	**0.08**	0.22
3	Government Intervention (5)	0.27	0.21	1	**0.19**	0.40	0.43	0.43	0.40	0.38	0.27	0.53
4	Monetary Policy (6)	**0.11**	**-0.04**	0.16	1	**0.18**	0.27	**0.18**	0.50	0.38	0.48	0.56
5	Foreign Investment (2)	0.43	**0.12**	0.35	0.15	1	0.62	0.59	0.56	0.49	0.47	0.66
6	Banking (7)	0.44	0.17	0.38	0.23	0.56	1	0.72	0.61	0.57	0.60	0.77
7	Wages/Prices (8)	0.40	**0.14**	0.38	0.16	0.54	0.65	1	0.56	0.58	0.57	0.71
8	Property Rights (10)	0.50	**0.09**	0.35	0.43	0.50	0.54	0.49	1	0.73	0.80	0.88
9	Regulation (9)	0.47	**0.11**	0.33	0.32	0.44	0.51	0.52	0.66	1	0.66	0.80
10	Black Market (3)	0.45	**0.06**	0.23	0.41	0.40	0.51	0.50	0.71	0.58	1	0.84
11	1997 Score	0.55	0.17	0.43	0.44	0.55	0.64	0.59	0.77	0.68	0.71	1

Bold: not significant at at least a 1 percent level. Numbers in parentheses refer to the numbering in table 1.

4. Review of previous empirical studies

This section reviews previous attempts to analyze the correlation between economic freedom and economic growth.

Barro (1994) employs the black market premium on foreign exchange as a proxy for governmental distortions of markets more generally. Its coefficient in a growth model estimated for about 100 countries is significantly negative, thereby suggesting that distortions of markets are adverse for economic growth. One may, however, doubt whether the black market premium is a proper indicator for lack of economic freedom. Furthermore, a thorough sensitivity analysis is lacking in this study. Alesina (1998) also uses the black market premium. In addition he employs data provided by Knack and Keefer (1995) on corruption, risk of expropriation, repudiation of contracts and the rule of law. All indicators (put under the heading of bureaucratic quality and rule of law) generally affect economic growth, but a sensitivity analysis is lacking.

Using a ranking of economic freedom constructed by Scully and Slottje (1991), De Vanssay and Spindler (1994) find a positive relationship between economic growth and this measure of economic freedom. However, they do not check whether their conclusion is sensitive with respect to the measure of economic liberty chosen. Furthermore, they do not apply some kind of sensitivity analysis to check whether conclusions are robust with respect to the specification of their model. De Haan and Siermann (1998) have applied the extreme bound analysis using all variants of the Scully-Slottje index. They find that the link between economic freedom and economic growth depends upon the measure used: for some variants of the Scully-Slottje index of economic freedom there appears a robust direct relationship, while for others there is no such relationship. These findings point to a serious problem, as all the measures are constructed as some combination of indicators for various aspects of economic freedom. Furthermore, the correlation with the Scully-Slottje indices and the indicators for economic freedom of Gwartney et al. (1996) is strikingly low. Although it is often argued that economic freedom will stimulate investment, De Haan and Siermann conclude that investment is not related to the Scully-Slottje measures for economic freedom.

Torstensson (1994) has also analyzed the impact of economic freedom on the growth performance using data for the period 1976-85 covering 68 countries. Two aspects of property rights are considered in this study. The first variable attempts to capture the degree to which property is state-owned and the other variable attempts to capture whether individuals are safe from arbitrary seizure of their property. Torstensson (1994) finds that the degree of state ownership does not seem to affect growth rates. However, arbitrary seizure of property affects growth negatively. A serious drawback of this study is the limited concept of economic freedom used, as well the absence of a thorough sensitivity analysis.

Although Gwartney et al. (1996) do not estimate growth models, these authors find that the countries with the highest ratings in terms of economic freedom in 1993-95, achieved an average annual growth rate of per capita real GDP of 2.4% during 1980-94. In contrast, the average annual growth of per capita real GDP for the 27 countries with the lowest ratings was minus 1.3% over the same period. No country with a persistently high economic freedom rating during the two recent decades failed to achieve a high level of income. Also improvements in economic freedom help according to these authors, as all 17 countries which improved their economic freedom significantly experienced positive growth rates.

Nelson and Singh (1998) use economic freedom as control variable in their model on the relationship between economic growth and political freedom. Their study refers to the 1970-89 period and includes 67 developing countries. The measure of economic freedom used is based on price stability, government size, discriminatory taxation and trade restrictions. The authors conclude that economic freedom excercises a significantly positive effect on economic growth. Again, a sensitivity analysis is lacking.

Finally, Beach and Davis (1998) report a positive correlation between economic growth over the period 1980-93 and the value of the Heritage Foundation/Wall Street Journal index for 1997. Apart from not including control variables, a more serious shortcoming is that the index and the estimation period do not refer to (more or less) the same sample period.

5. New evidence

Using the variant of the extreme bound analysis of Levine and Renelt (1992) and Leamer (1983) we analyze in this section the robustness of the relationship between economic freedom and economic growth.[7] We focus on the sample period 1975-1990 as both the indicators of economic freedom of Gwartney et al. (1996) and a large number of variables to be included in the growth regressions are available for a considerable number of countries. Growth equations of the following general form have been estimated:

$$\Delta Y_i = \alpha M_i + \beta F_i + \gamma Z_i + u_i \qquad (1)$$

where the subscript refers to country i; ΔY_i is the average growth of per capita GDP of country i; M_i is a vector of standard economic explanatory variables, which according to previous empirical studies have shown to be robustly linked with economic growth; F_i is an indicator of economic freedom in country i; Z is a vector of up to three possible additional economic explanatory variables, which according to the literature may be related to economic growth; and u_i is an error term.

The data on the average growth rate of GDP per capita are taken from the Summers and Heston data file (version 5.6) as described in Summers and Heston (1991). The basic set of economic variables in the M vector consists of: initial income in US-dollars; average investment share to GDP - both from the Summers and Heston (SH) data file - and secondary-school enrollment in 1975, which is taken from the Barro-Lee (BL) data set. These three variables were chosen on the basis of the findings of Levine and Renelt (1992). The additional economic variables in the Z vector are: average population growth (POP; SH); the average ratio of real government consumption to GDP (GOV; SH); the average inflation rate (INF; SH) and the average ratio of export and import to GDP (OPEN; SH). Population growth is added to the regression as it has been suggested that this factor may enhance growth (see Baumol et al., 1989). The ratio of government consumption to GDP is taken up because Barro (1991), among others, included this variable in his growth equations. Barro (1991) finds that government consumption has a significant negative effect. The inflation rate is added because Fischer (1993) and Barro (1995) find it to be robustly correlated with growth. Openness is taken up since some economists have claimed that open economics grow faster, because of higher efficiency gains (see e.g. Feder, 1982 and Romer, 1989). The variables inflation and government spending are also included because of the critique concerning the inclusion of these type of variables in indicators of economic freedom as raised section 2. If it can be shown that even if these variables are included in the growth regression the coefficient of economic freedom remains significant, this would strengthen the view that economic growth really matters for economic growth.[8]

Equation 2 presents the estimation results for the basic model. The standard errors in the regression are based on White's (1980) heteroskedasticity-consistent covariance matrix. The dependent variable ΔY_{7590} is the average growth rate of GDP per capita over the period 1975-1990. In line with most previous research, the coefficients of all variables are significantly different from zero.

$$\Delta Y_{7590} = 0.10 - 0.016\ YCAP_{75} + 0.003\ INV_{7590} + 0.0004\ SEC_{75} \qquad (2)$$
$$(3.03)\ (-3.23)\qquad (4.73)\qquad (1.68)$$

adj.R^2 = 0.29

Note: White *t*-values are shown in parentheses.

A problem that always plagues analyses like the one in the present paper is causality and endogeneity (see e.g. Paldam, 1998). To ensure that the problem of causality is minimal, we have estimated models for two indicators of economic freedom: the level in 1975 (the beginning of our estimation period) and the change in economic freedom over 1975-1990 (our estimation period). As it is possible that the latter variable is endogenous, we have first performed a test as suggested by Maddala (1992). This test involves running regressions for the change in economic freedom indicators using as regressors all the determinants of GDP growth plus other variables that are relevant in explaining our economic freedom indicators (see also Nelson and Singh, 1998). Next, the predicted values for the change in economic freedom indicators are added to the regression. If its coefficient is insignificant, the endogeneity hypothesis is rejected. We find that in all cases the change in economic freedom can be regarded as an exogenous variable according to this test.[9]

Table 6 shows the results of the sensitivity analysis using the 1975 level of the economic freedom indicators outlined in section 2 for 80 countries.[10] Table 7 shows the results if we use the change in economic freedom between 1975-90. For each indicator the outcomes using the three 'basic' variables and adding the freedom measure are given in the row labelled "base". As there are three indicators employed (**Ie**, **Is1** and **Is2)**, there are three base regressions. In the rows labelled "high" and "low" the maximum spread of the coefficients of the economic freedom indicators is shown if some vector Z is added as a set of additional explanatory variable(s). As explained before, this vector is constructed using a combination of up to three of the following variables: average population growth (POP); the average ratio of real government consumption to GDP (GOV); the average inflation rate (INF) and the average ratio of export and import to GDP (OPEN). It is also indicated which additional variables in the regression produced the highest and lowest values of the coefficient, respectively.

Table 6 Sensitivity Results for Fraser Institute Indices for Level of Freedom 1975 (Dependent Variable: Growth Rate of Real Per Capita GDP 1975-1990)

Level freedom 1975		β	*t*	adj. R^2	Other variables	Robust/ fragile
Ie	high	0.040	1.41	0.38	POP, INF	fragile
	base	0.023	0.79	0.29		
	low	-0.000	-0.01	0.35	GOV, INF, OPEN	
Is1	high	0.041	1.45	0.38	POP, INF	fragile
	base	0.026	0.89	0.30		
	low	0.001	0.05	0.36	GOV, OPEN	
Is2	high	0.030	1.33	0.37	POP, INF	fragile
	base	0.014	0.61	0.29		
	low	-0.001	-0.08	0.36	GOV, OPEN	

It follows from table 6 that the level of economic freedom in 1975 is not robustly related to economic growth. The coefficient of the level of economic freedom is generally insignificant and sometimes even changes signs, which lead us to the conclusion that the relationship is fragile. This conclusion also holds if we use our preferred indicators of economic freedom as outlined in section 3 (not shown). However, table 7 shows that the change in economic freedom is robustly related to economic growth. Table 8 shows the results for our preferred indicators. Again the relationship between the change in economic freedom and economic growth is robust, albeit that both the estimated coefficients and their significance is substantially lower.

Table 7 Sensitivity Results for Fraser Institute Indices for Increase in the Level of Freedom 1975-90 (Dependent Variable: Growth Rate of Real Per Capita GDP 1975-1990)

Increase in freedom 1975-90		β	*t*	adj. R^2	Other variables	Robust/ fragile
Ie	high	0.080	4.65	0.43	OPEN, INF	robust
	base	0.079	4.20	0.37		
	low	0.055	2.82	0.47	GOV, POP, OPEN	
Is1	high	0.070	3.55	0.40	OPEN, INF	robust
	base	0.069	3.25	0.34		
	low	0.044	2.04	0.45	POP, GOV, OPEN	
Is2	high	0.068	4.43	0.42	INF, OPEN	robust
	base	0.066	3.92	0.37		
	low	0.046	2.52	0.46	GOV, POP, OPEN	

Table 8 Sensitivity Results for Corrected Fraser Institute Indices for Increase in the Level of Freedom 1975-90 (Dependent Variable: Growth Rate of Real Per Capita GDP 1975-1990)

Increase in freedom 1975-90		β	*t*	adj. R^2	Other variables	Robust/ fragile
Ie_c	high	0.066	4.43	0.44	OPEN	robust
	base	0.063	3.85	0.37		
	low	0.044	2.24	0.37	GOV, POP, INF	
$Is1_c$	high	0.065	4.15	0.42	OPEN, INF	robust
	base	0.059	3.35	0.35		
	low	0.038	1.81	0.37	POP, GOV	
$Is2_c$	high	0.055	3.97	0.42	OPEN	robust
	base	0.052	3.52	0.35		
	low	0.034	1.96	0.37	GOV, POP	

Note: the economic freedom indicators are corrected for items that we find suspect. See section 4 for a further explanation.

One possible objection towards our analysis so far could be that the choice of our sample of countries, although only based on data availability, may have influenced our results. To check this, we have used some kind of rolling regressions technique, using every time only 60 observations. We started with the first 60 countries. In the

next regression the first country was excluded, whereas country 61 was added, etc. This has been done for all possible specifications as used in the sensitivity analysis outlined above. Our basic finding is that the coefficient of the change in economic freedom is quite stable and that, therefore, there are no indications that our sample choice may have influenced our basic findings. Figure 1 shows the estimated coefficients in case we use **Ie** as indicator for economic freedom. It is clear that in all regressions the coefficient is significantly different from zero. Similar results were found for the other indicators (not shown).

[Insert figure 1]

An alternative approach to examine the robustness of empirical relationships has recently been suggested by Sala-i-Martin (1997). According to this author the test applied in the extreme bound analysis is too strong for any variable to really pass it: if the distribution of the estimators has some positive and some negative support, then one is bound to find one regression for which the estimated coefficient changes signs if enough regressions are run. Instead of analyzing the extreme bounds of the estimates of the coefficient of a particular variable, Sala-i-Martin has analyzed the entire distribution. He concludes that the picture emerging from the empirical growth literature is not the pessimistic "Nothing is Robust" that we get with the extreme bound analysis. Instead, he finds that a substantial number of variables can be found to be strongly related to growth. This approach can, of course, also be applied to the relationship between economic freedom and economic growth.

Apart from the variables in the Z-vector as outlined above, we have used a number of variables from the Barro-Lee data set, which are all explained in more detail in the Appendix. All possible combinations of up to three of these variables were added to the explanatory variables in the base regression. This gave a total of 2952 regressions. The White t-values of the economic freedom indicator **Ie** are shown in figures 2 (level in 1975) and 3 (change between 1975-90). It follows from these figures that generally only the coefficients of the change in economic freedom are significantly different from zero. Similar results are found for **Is1** and **Is2** (not shown).

[insert figures 2-3]

An interesting issue is whether economic freedom affects economic growth through stimulating investment or human capital. In that case the results reported in tables 6-8 may be biased, since investment and human capital are included as explanatory variables in the basic model. Therefore, we have followed the same procedure as outlined in the previous section. In the M vector for the base model for investment spending two variables are included: the secondary school enrollment rate in 1975 (SEC_{75}), and the average share of export and import to GDP over the period 1975-1990 (OPEN). Levine and Renelt (1992) conclude that export is robustly related with investment. The variables included in the Z-vector are: GOV, POP, YCAP and INF. It followed that the coefficients for the level of economic freedom in 1975 were generally not significant (not shown). Table 9 shows the outcomes of the sensitivity analysis for the change in economic freedom.[11] Again there is no evidence for a robust relationship. This is an interesting outcome for two reasons. First, it implies that the results in table 7 were not biased due to the inclusion of investment as explanatory variable. Second, it is often argued that economic

freedom will stimulate investment. Our results do not support that claim.

We have also performed this type of sensitivity analysis for secondary school enrollment rate in 1985 (Sec85). Our M-vector includes $Prim_{75}$ (the primary school enrollment rate in 1975). This variable is included as primary schooling is a prerequisite for secondary schooling and hence it can be expected that the level of secondary school enrollment is partly determined by previous primary school enrollment figures. We do not find a robust relationship between secondary school enrollment and economic freedom (not shown).

Table 9 Sensitivity Results for Fraser Institute Indices for Increase in the Level of Freedom 1975-90 (Dependent Variable: Investment as share of GDP, 1975-1990)

Increase in freedom 1975-90		β	*t*	adj. R^2	Other variables	Robust/ fragile
Ie	high	9.14	2.10	0.55	YCAP	fragile
	base	8.42	1.54	0.36		
	low	0.17	0.04	0.54	GOV, POP, INF	
Is1	high	8.19	1.65	0.54	YCAP, POP	fragile
	base	6.62	1.19	0.36		
	low	-1.14	-0.24	0.54	GOV, INF, POP	
Is2	high					fragile
	base	10.40	2.21	0.38		
	low	3.38	0.84	0.54	GOV, INF, POP	

6. Concluding comments

As follows from the citation of Milton Friedman at the beginning of this paper, it is often maintained that economic freedom may further high levels of economic growth. Recently, a number of indicators for economic freedom have become available, which make it possible to test this view. The purpose of this paper was twofold. First, a thorough comparison and evaluation of these indicators, and second, a careful analysis to examine whether there is indeed a close and robust relationship between these measures of economic freedom and economic growth. In the paper we focus on the indicators of The Heritage Foundation/Wall Street Journal and of the Fraser Institute. It is concluded that although these measures differ somewhat in their coverage, they show similar rankings for the countries covered. Some elements in these measures are, however, questionable. Especially the way government spending and taxes are taken up may be questioned. Nevertheless, we have used the various indicators of the Fraser Institute in empirical growth models, following both the so-called extreme bound analysis and the variant thereof as suggested by Sala-i-Martin (1997). The models are estimated for the period 1975-90 for 80 countries, using both the level of economic freedom in 1975 and the change in freedom

between 1975-90 as explanatory variables. Our main conclusion is that more economic freedom fosters economic growth, but that the level of freedom is not related to growth. In other words, our findings imply that more economic freedom will bring countries more quickly to their steady state level of economic growth (if they are below that level), but that the level of steady state growth is not affected by the level of economic freedom.

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Figure 2

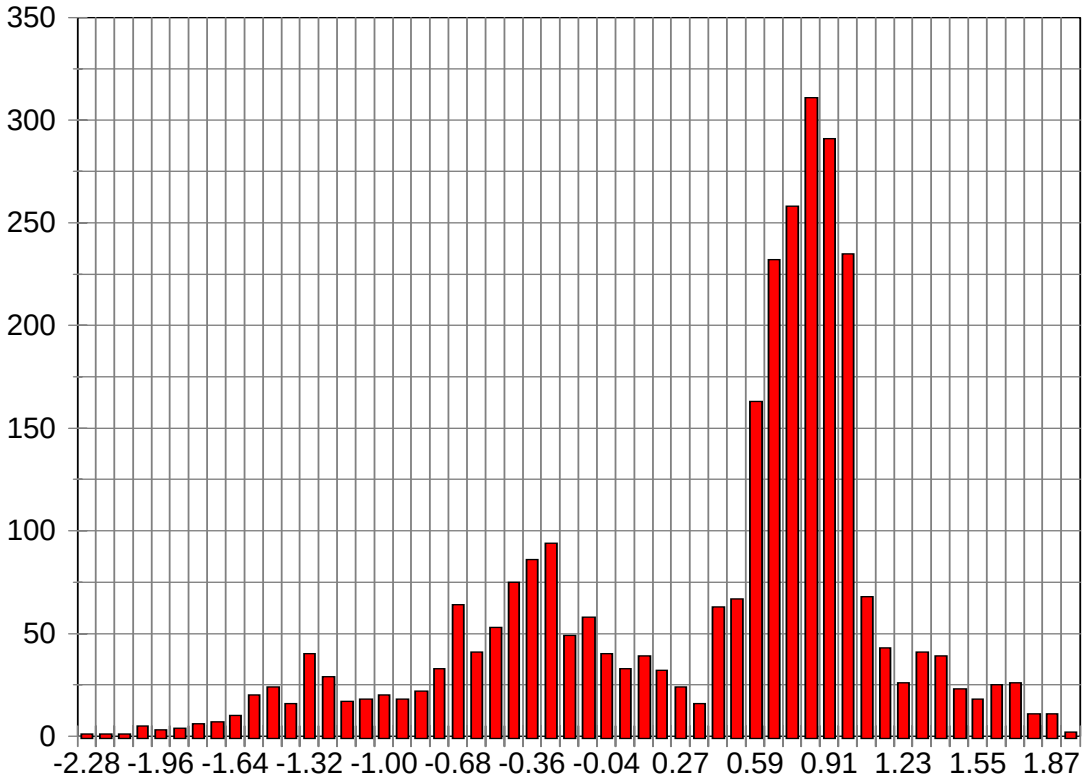
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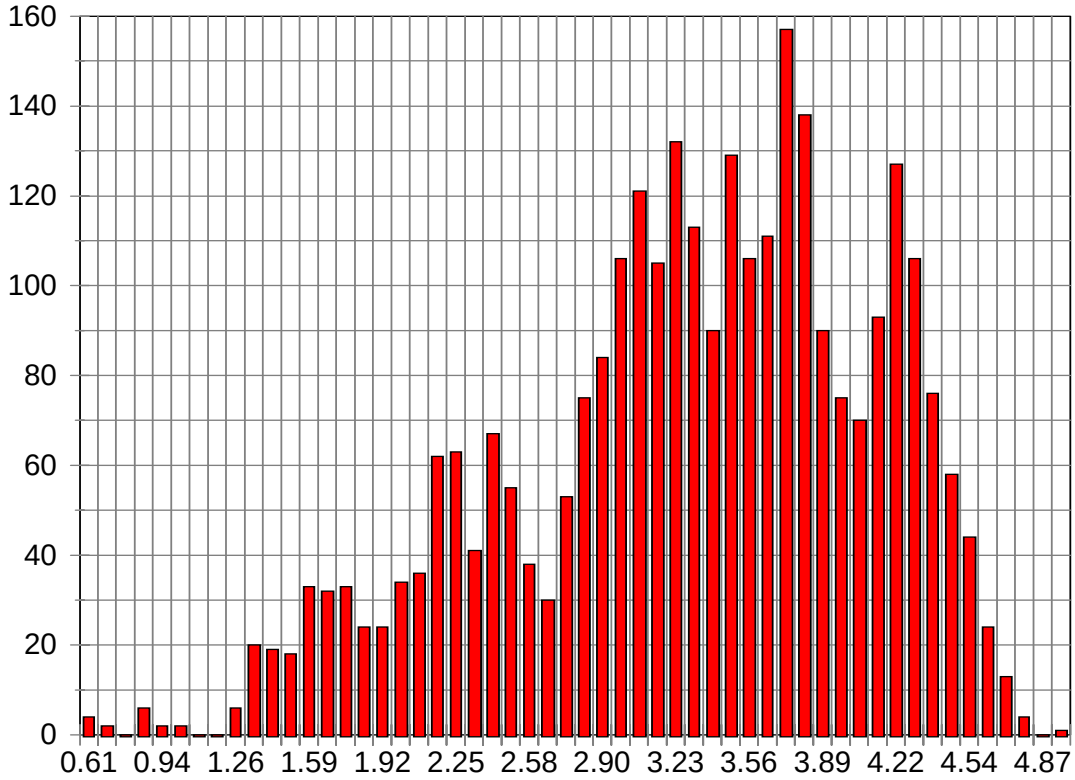
Figure 3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Data Appendix

Penn World Table (Mark 5.6a)

GDP	Log of Real GDP per capita (1985 international prices; Laspeyres Index)
GRGDP	Average GDP growth
INVSH	Real Gross Domestic Investment (private and public) (% of GDP; 1985 international prices)
POP	Population
GRPOP	Average Population growth
CSH	Real Consumption (% of GDP; 1985 international prices)
GSH	Real Government (public consumption) (% of GDP; 1985 international prices)
GRP	Average growth rate of GDP deflator
OPENSH	Openness (exports+imports)/GDP (current international prices)

Barro-Lee data

SECSCH	Percentage of "secondary school attained" in the total pop.
PRISCH	Percentage of "primary school attained" in the total pop.
HIGHSCH	Percentage of "higher school attained" in the total pop.
PRIGHTS	Index of political rights (from 1 to 7; 1=most freedom), Source: GASTIL
PR7289	PRIGHTS over 1972-1989
CIVLIB	Index of civil liberties (from 1 to 7; 1=most freedom), Source: GASTIL
CL7289	CIVLIB over 1972-1989
AREA	Size of land, million squares Km.
DIST	Average distance to capitals of world 20 major exporters, weighted by values of bilateral imports, 1000 km.
OWTI	Own-import weighted non-tariff frequency on intermediate inputs and capital goods
FREEOP	Measure of "Free trade openness" (=.528-.26lnAREA-.095lnDIST)
FREETAR	Measure of tariff restriction (FREEOP*ln(1+OWTI)
BMP	Black market premium
BMPL	log(BMP)
LLY	Ratio of liquid liabilities to GDP
ASSASS	Number of assassinations per million population per year (1975-1985)
COUP	Number of coups per year (1975-1985)
REVOL	Number of revolutions per year (1975-1985)
TOT	Terms of trade shock (growth rate of export prices minus growth rate of import prices) (1975-1985)
WARDUM	Dummy for countries that participated in at least on external war over the period, 1960

-85

WARTIME The fraction of time over 1960-85 involved in external war

Table A1 shows the countries in our sample and the scores of various freedom indicators (1975), whereas table A2 shows the increase in economic freedom. Source: Gwartney et al. (1996).

Table A1. Economic Freedom indicators, 1975.

Country	Is1	$Is1_c$	Is2	$Is2_c$	Ie	Ie_c
ALGERIA	3.5	2.4	3.0	2.4	3.6	2.8
ARGENTINA	3.1	2.6	3.1	3.6	3.1	3.0
AUSTRALIA	5.0	5.8	6.1	6.1	5.4	5.8
AUSTRIA	4.6	6.2	4.9	5.3	4.8	5.8
BANGLADESH	3.5	1.9	2.5	1.8	3.3	1.9
BELGIUM	5.5	8.7	7.3	8.6	6.2	8.4
BENIN	3.8	2.7	3.0	2.5	3.5	2.6
BOLIVIA	5.5	4.8	4.9	5.6	5.3	5.3
BRAZIL	3.2	2.3	2.0	2.0	2.8	2.3
CAMEROON	4.7	2.6	3.3	2.5	4.2	2.6
CANADA	6.1	7.5	7.5	7.8	6.5	7.4
CHILE	2.8	3.7	2.5	3.3	2.8	3.5
COLOMBIA	4.3	2.6	2.6	2.4	3.7	2.7
CONGO	4.5	4.1	4.2	3.4	4.5	4.0
COSTA RICA	5.2	5.2	5.6	5.7	5.3	5.4
CYPRUS	3.9	4.1	3.6	3.5	3.8	4.0
DENMARK	3.8	5.8	4.3	4.9	4.1	5.4
DOMINICAN REP.	3.6	2.3	2.7	2.3	3.4	2.4
ECUADOR	4.3	4.6	4.6	5.3	4.4	4.9
EGYPT	2.4	3.6	3.0	3.4	2.7	3.8
EL SALVADOR	4.7	3.8	3.6	3.5	4.3	3.8
FIJI	4.6	3.4	3.6	3.1	4.1	3.1
FINLAND	3.9	5.6	4.0	4.9	4.0	5.2
FRANCE	4.3	5.6	4.4	4.7	4.4	5.3
GERMANY, WEST	5.9	8.6	7.3	8.5	6.4	8.4
GHANA	2.5	0.5	1.3	0.4	2.1	0.5
GREECE	3.9	4.1	3.2	3.5	3.7	3.7
GUATEMALA	6.5	4.9	5.3	5.3	5.9	5.0
HONDURAS	7.4	6.3	6.8	6.6	7.1	6.4
HONG KONG	9.2	9.1	9.0	9.3	9.0	9.0
HUNGARY	3.0	2.3	2.1	2.2	3.1	2.8
ICELAND	2.7	2.0	2.4	1.9	2.6	2.0
INDIA	3.3	1.6	2.3	1.4	3.0	1.3
INDONESIA	5.2	4.9	4.6	5.3	5.0	5.1
IRAN	5.0	6.2	4.8	5.5	4.9	6.0
IRELAND	3.9	5.1	4.6	4.4	4.2	4.6
ISRAEL	2.1	2.7	2.3	2.6	2.2	2.7
ITALY	4.1	4.6	3.6	3.8	4.0	4.3
JAMAICA	3.2	2.8	2.8	2.3	3.0	2.5
JAPAN	5.2	6.1	5.3	5.4	5.3	5.6
JORDAN	4.2	4.6	4.4	4.3	4.3	4.7
KENYA	3.4	3.4	3.9	3.1	3.8	3.5
KOREA, REP.	4.3	4.1	3.2	3.7	4.0	4.0
MALAWI	4.3	3.5	3.4	3.0	4.1	3.5
MALAYSIA	5.2	5.4	5.9	5.8	5.4	5.5
MALI	4.4	2.7	3.2	2.6	4.0	2.8
MAURITIUS	3.9	2.8	3.1	2.7	3.7	2.9
MEXICO	5.0	4.6	4.5	4.8	4.8	4.3
NETHERLANDS	5.7	8.2	7.1	8.1	6.3	8.1
NEW ZEALAND	4.3	5.2	4.6	4.5	4.5	4.9
NICARAGUA	6.4	5.4	5.5	5.9	6.0	5.6
NORWAY	3.6	5.3	3.8	4.4	3.8	5.1
PAKISTAN	2.9	1.9	2.6	1.8	3.0	1.9
PANAMA	7.0	8.4	8.2	8.6	7.3	8.3
PARAGUAY	5.6	5.0	5.0	5.7	5.3	5.2
PERU	3.7	2.1	2.1	2.0	3.1	2.2
PHILIPPINES	4.6	3.0	3.6	3.1	4.4	3.3
PORTUGAL	2.2	2.4	1.8	1.9	2.3	2.4

RWANDA	3.8	1.5	2.5	1.6	3.1	1.6
SENEGAL	4.3	3.2	3.0	3.0	3.8	3.3
SIERRA LEONE	4.2	2.1	2.9	2.1	3.8	2.3
SINGAPORE	6.8	7.1	5.9	6.4	6.5	6.8
SOUTH AFRICA	3.9	4.6	3.7	4.0	4.1	4.6
SPAIN	3.9	3.8	3.0	3.3	3.6	3.5
SRI LANKA	3.6	1.5	2.8	1.4	3.6	1.7
SWEDEN	3.5	5.7	4.3	4.9	3.9	5.3
SWITZERLAND	7.1	7.4	7.2	7.5	7.1	7.4
SYRIA	3.7	4.6	4.5	5.3	3.9	4.9
TAIWAN	4.9	5.3	4.8	5.6	4.9	5.5
THAILAND	4.9	3.7	3.7	3.4	4.6	3.6
TOGO	3.2	2.9	2.7	2.6	3.1	2.8
TRINIDAD&TOBAGO	3.2	2.1	2.3	1.6	2.9	1.9
TUNISIA	3.4	1.9	1.9	1.8	2.9	2.0
TURKEY	2.8	2.0	1.9	1.9	2.5	2.0
U.K.	5.0	5.1	4.7	4.3	4.7	4.7
U.S.A.	6.0	8.5	7.9	8.4	6.6	8.1
UGANDA	1.2	0.4	1.3	0.5	1.2	0.5
URUGUAY	5.8	6.5	6.2	6.6	5.7	6.0
VENEZUELA	6.9	6.9	6.3	7.2	6.4	6.7
ZAMBIA	2.9	2.8	3.0	2.5	3.1	3.0

Table A2. Change in economic freedom, 1975-90

Country	Is1	$Is1_c$	Is2	$Is2_c$	Ie	Ie_c
ALGERIA	-0.8	-0.3	-0.4	-0.3	-0.7	-0.5
ARGENTINA	0.7	0.3	0.1	-0.2	0.3	-0.2
AUSTRALIA	1.0	2.0	1.2	1.8	1.1	2.0
AUSTRIA	0.8	1.3	1.8	2.0	1.2	1.7
BANGLADESH	0.3	0.6	1.1	0.8	0.7	0.8
BELGIUM	0.4	-0.3	0.2	-0.3	0.5	-0.1
BENIN	0.6	1.1	0.8	0.9	0.8	1.1
BOLIVIA	0.8	1.1	0.6	0.4	0.5	0.7
BRAZIL	-0.3	-0.7	-0.6	-0.9	-0.7	-1.0
CAMEROON	-0.2	0.9	0.6	0.6	0.2	0.8
CANADA	0.8	1.2	1.0	1.0	1.0	1.3
CHILE	2.9	3.6	3.8	4.2	3.3	3.9
COLOMBIA	0.5	1.2	0.9	1.2	0.7	1.2
CONGO	-1.2	-1.9	-1.1	-1.3	-1.1	-1.6
COSTA RICA	1.4	1.6	1.5	1.5	1.2	1.5
CYPRUS	-0.1	-0.0	0.1	0.2	0.2	0.1
DENMARK	0.8	1.8	2.1	2.5	1.3	2.1
DOMINICAN REP.	0.0	0.0	0.0	0.0	0.0	-0.0
ECUADOR	0.6	0.1	-0.3	-0.5	0.2	-0.3
EGYPT	1.8	1.1	1.7	1.6	2.0	1.3
EL SALVADOR	-0.4	-0.1	-0.5	-0.2	-0.3	-0.2
FIJI	0.7	1.7	1.2	1.7	1.1	1.9
FINLAND	0.9	1.7	2.3	2.3	1.5	2.0
FRANCE	1.2	2.3	2.6	3.0	1.8	2.5
GERMANY, WEST	0.4	0.6	0.5	0.6	0.6	0.7
GHANA	1.1	1.7	1.3	1.7	1.2	1.7
GREECE	-0.5	0.5	0.3	0.4	-0.2	0.7
GUATEMALA	0.1	1.6	0.7	1.3	0.4	1.4
HONDURAS	-1.4	0.1	-1.1	0.1	-1.2	0.1
HONG KONG	0.1	0.4	0.2	0.4	0.2	0.5
HUNGARY	0.0	1.0	0.6	0.6	0.0	0.4
ICELAND	2.0	3.4	3.0	3.7	2.2	3.4
INDIA	0.4	1.2	1.0	1.3	0.7	1.6
INDONESIA	1.4	1.7	1.4	1.4	1.5	1.7
IRAN	-1.8	-3.0	-1.8	-1.8	-1.7	-2.4
IRELAND	1.1	0.9	1.1	1.0	1.3	1.3
ISRAEL	0.9	1.1	0.5	0.6	0.7	0.8
ITALY	1.3	2.7	2.8	3.2	1.9	2.9
JAMAICA	2.0	0.6	1.0	1.0	1.7	1.0
JAPAN	1.7	2.0	2.6	2.7	2.1	2.4
JORDAN	0.2	-0.8	-0.3	-0.7	-0.1	-0.8
KENYA	1.1	0.6	0.1	0.7	0.6	0.7
KOREA, REP.	0.9	0.8	1.3	0.9	1.1	0.8
MALAWI	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3
MALAYSIA	1.9	1.7	1.5	1.6	1.9	1.8
MALI	1.0	1.7	0.8	1.3	0.9	1.6
MAURITIUS	1.7	1.8	1.7	1.8	1.7	1.8
MEXICO	0.3	0.8	0.3	0.6	0.3	1.0
NETHERLANDS	0.1	0.6	0.5	0.6	0.4	0.6
NEW ZEALAND	1.7	2.3	2.6	3.1	1.9	2.6
NICARAGUA	-4.4	-3.5	-4.4	-4.5	-4.5	-3.9
NORWAY	1.2	2.0	2.3	2.8	1.5	2.1
PAKISTAN	1.3	1.9	1.7	2.1	1.5	2.2
PANAMA	-0.7	-1.2	-0.7	-1.2	-0.6	-1.1
PARAGUAY	0.8	1.0	0.6	0.6	0.8	0.9
PERU	0.3	0.9	0.3	0.6	0.3	0.6
PHILIPPINES	1.1	1.2	0.8	0.9	1.0	1.0
PORTUGAL	1.9	2.6	2.1	2.3	1.8	2.4
RWANDA	0.9	1.2	1.6	1.2	1.5	1.3
SENEGAL	0.0	0.8	1.0	0.8	0.5	0.8
SIERRA LEONE	-0.3	-0.1	-0.7	-0.4	-0.6	-0.5
SINGAPORE	1.7	2.0	2.6	2.8	2.0	2.4
SOUTH AFRICA	0.7	0.5	0.4	0.5	0.3	0.4
SPAIN	0.8	2.4	1.7	2.2	1.2	2.4
SRI LANKA	0.6	1.5	0.6	1.5	0.6	1.5
SWEDEN	1.0	1.5	1.5	1.6	1.3	1.6
SWITZERLAND	0.2	1.3	1.0	1.2	0.6	1.2
SYRIA	-0.5	-1.2	-1.9	-2.4	-0.7	-1.4
TAIWAN	1.0	2.1	1.6	1.7	1.2	1.9
THAILAND	1.4	2.6	1.8	2.5	1.6	2.7
TOGO	0.6	0.4	0.9	0.6	0.8	0.6

TRINIDAD&TOBAGO	1.1	0.9	1.2	0.8	1.1	0.9
TUNISIA	0.9	2.2	2.4	2.3	1.6	2.2
TURKEY	1.8	3.0	2.5	3.2	2.0	2.9
U.K.	1.6	3.7	3.1	4.3	2.3	3.9
U.S.A.	1.4	0.3	0.8	0.3	1.2	0.5
UGANDA	1.3	0.4	0.2	0.3	1.0	0.2
URUGUAY	0.5	-0.0	0.3	0.0	0.4	0.3
VENEZUELA	-1.4	-1.3	-1.3	-1.7	-1.2	-1.4
ZAMBIA	-1.1	-1.0	-1.2	-1.0	-1.2	-1.2

Notes

1. This definition goes further than the one by Holmes et al. (1998): "absence of government coercion or constraint on the production, distribution or consumption of goods and services" as it also includes secure property rights. The definition of Gwartney et al. is very much influenced by the work of Rabushka. See, for instance, Rabushka (1991a,b).

2. Apart from the definition issue, there is, of course also the question about the sequential relationship between economic and political freedom. According to Friedman (1962), history suggests that capitalism is a necessary condition for political freedom, but not a sufficient one. Others have different views on this issue, that will not be dealt with in the present paper.

3. Previous attempts to construct indicators for economic freedom include: Spindler and Still (1991) and Scully and Slottje (1991). Knack and Keefer (1995) provide information on many aspects included in the indicators discussed below, including: risk of contract repudiation, risk of expropriation, corruption, and rule of law.

4. Gwartney et al. (1996) argue that, as government expenditures increase, more and more of these expenditures tend to be channelled toward activities outside of the protective and productive functions of government.

5. Non-parametric correlation is more robust than linear correlation, more resistant to unplanned defects in the data, in the same sense that the median is more robust than the mean (Press et al., 1986). Kendall's correlation coefficient is more parametric than that of Spearman. Since the first uses a 'weaker' property of the data there can be applications in which r_k is more robust than r_s; however, since it throws away information that is available to r_s, there can also be applications where r_k is less powerful than r_s. As both statistics are in general use, we apply both.

6. The first three rows (the comparison of the indicators from the Fraser-institute) refer to a sample of 102 countries; the comparison reported in the final row and column refers to 79 countries.

7. See also De Haan and Siermann (1995; 1996) who applied this approach to examine the effect of political and civil freedoms on economic growth. Although very popular, the extreme bound analysis has not been without its critics (see e.g. Pagan, 1987).

8. An alternative, of course, is to recalculate the indicators for economic freedom, leaving suspect items aside. This approach is also followed.

9. The t-statistics are: 0.25, -0.48, and -0.13.

10. The scores for the freedom indicators used are shown in the appendix.

11. In one case the base regression had the highest coefficient so that the cells in the row "high" are empty.